April 5, 1958

VOL. 73 NO. 14 PAGES 209-224

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Disturbed Skies

See Page 212

A SCIENCE SERVICE PUBLICATION

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PHYSICS

Reproduce Star's Heat

Scientists at the Naval Research Laboratory have reproduced star-like temperatures through the use of equipment that may contribute to controlled fusion reactions.

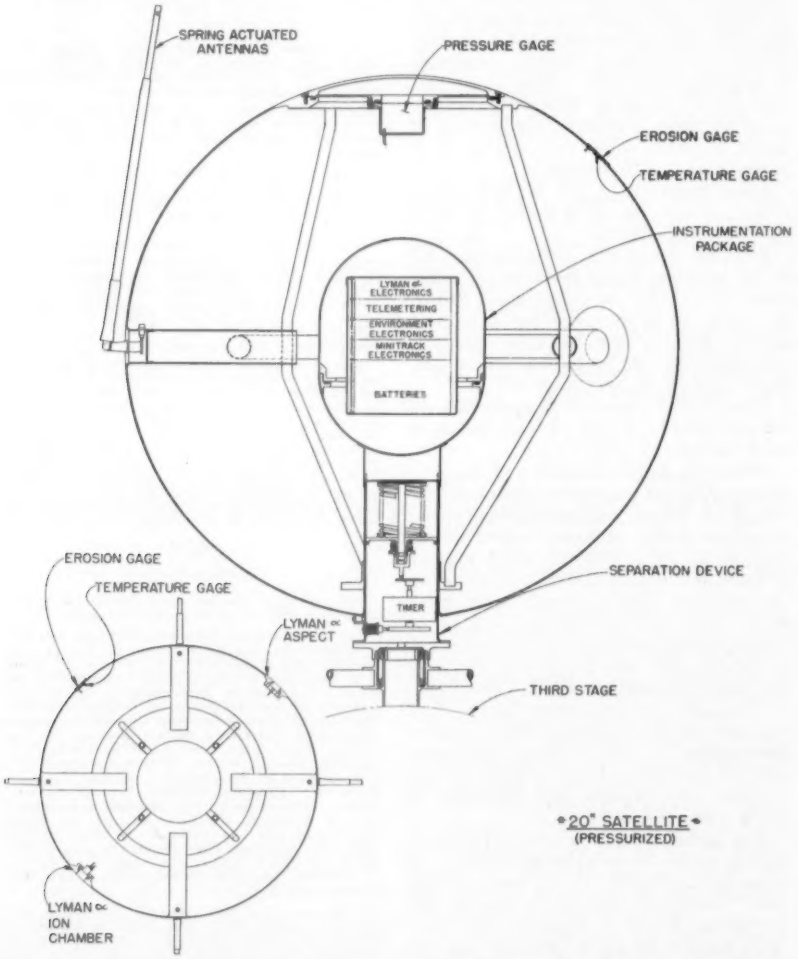
➤ STAR-LIKE temperatures in excess of a million degrees, which could in the future lead to successful control of thermonuclear reactions for peaceful power, have been reached in the Naval Research Laboratory.

Dr. A. C. Kolb reported his experiments in momentarily reproducing stellar atmospheres to the Optical Society of America meeting in Washington.

Although his work is aimed at developing reliable methods for measuring the temperatures and pressures of gases at very high temperatures, the equipment used has all the necessary "ingredients" for controlling fusion reactions, Dr. Kolb told SCIENCE SERVICE.

The possibility of producing power from the virtually unlimited supply of heavy hydrogen in the world's oceans has stimulated high-temperature research in many countries.

The method used to produce the high temperatures at NRL is to accelerate ionized gases to velocities approaching 500,000 miles an hour in a shock tube by electromagnetic forces.



INSTRUMENTATION FOR IGY SATELLITE—The 21.5 pound, 20-inch round earth satellite that will be launched as part of the United States' scientific program for the International Geophysical Year may contain solar cell mercury batteries, ion chambers, thermistors, erosion gauges, a Minitrack transmitter, meteorite collision memory devices, telemetry coding systems, and Lyman alpha storage units.

These temperatures can be inferred from the measured speed of the shock wave.

The problem is that complicated processes can affect the accuracy of temperatures inferred in this way. By analyzing the light produced by shock waves, more accurate temperature measurements are in prospect.

At the Naval Research Laboratory the hot gases are kept away from the cold walls of the shock tube by a method that reverses the so-called pinch effect. At NRL, the shock tube containing the gas is surrounded with coils that carry high currents, and these currents produce a magnetic field that pushes the gas into the tube's center.

In a pinch tube, currents are passed along a tube and the resultant magnetic fields encircle the pinched gas.

The currents for the coils are produced by discharge of a large condenser bank that is rated at 20,000 volts. When discharged into a short circuit, 15,000,000 amperes are possible, a peak power of nearly 100 billion watts.

Certain technical problems associated with switching high currents have been solved, in collaboration with L. J. Melhart and T. H. DeRieux, and have made possible the practical use of condenser discharges involving tens of millions of amperes at relatively low cost for the switch gear and electrical connections.

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ENGINEERING

Thermo-Electron Engine Holds Great Promise

➤ THE PROMISE of directly changing atomic energy into electricity is seen a step closer with the development of thermo-electron engine.

The device operates without any moving mechanical parts. It is based on the principle that when there is a temperature difference between two metal plates, electrons flow from the hot to the cold one. These electrons form a stream of electricity that can be tapped.

So far, the process has been conducted only inside a large vacuum tube, but the inventors believe it will eventually become practical for many uses.

The thermo-electron engine was developed during the last five years by Drs. George N. Hatsopoulos and Joseph Kaye of Massachusetts Institute of Technology, Cambridge, Mass. The model has produced electric power with thermal efficiencies of about 12%.

Advantages of the thermo-electron engine over the old-fashioned steam engine, a modern steam turbine or an atomic engine in which heat is converted into electricity by means of a steam turbine include:

1. Because it uses no moving machinery to convert heat to electricity, maintenance problems should be virtually eliminated.

2. Where size and weight are at a premium, as they are in missiles and satellites, it will have significant advantages over conventional systems.

3. On the basis of efficiency alone, it should be more than competitive in the small power plant field.

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METEOROLOGY

Winter Weather Record

Official confirmation has arrived: the 1957-58 winter saw records set for cold weather and storms in many parts of the country, with abnormally mild weather in the Far West.

See Front Cover

➤ FOR THOSE who want official confirmation, the Weather Bureau in Washington agrees: It was an unusual winter.

Prolonged cold in the Southeast, paralyzing snowstorms in the Northeast, tornadoes in the Midwest and South, and persistent, abnormally mild weather in the Far West were the main weather highlights for the winter season.

Persons still digging out from exceptionally heavy snows in the Northeast may find it hard to believe, but the winter season as far as weathermen is concerned starts on Dec. 1 and ends the last day of February. Having now had a chance to correlate and compare information from the 1957-58 winter, weathermen found many new records were set.

More than half the nation had average temperatures above normal, including all areas west of the Continental Divide, the northern Plains states, most of Wisconsin and Michigan, and the extreme Northeast.

Florida has Record Low

Florida, on the other hand, had its coldest winter. New records for sustained cold and frequency of freezes were set from almost one end of the state to the other. It was the first time that Florida experienced severe freezes in all three winter months. For most of the state, average temperatures for the period from December through February were the lowest on record.

Florida's cold winter season with frequent rains was one of the worst for agricultural interests in the history of the state and very adversely affected the tourist business.

The cold wave that pushed the freeze-line into southern Florida on February 17 and 18 affected virtually all areas east of the Rocky Mountains. The week ending Feb. 16 averaged more than 20 degrees below normal in the middle and lower Mississippi Valley, the coldest week in some sections there in many years.

The most notable temperature recorded during this cold period was 23 degrees below zero at Mt. Mitchell, N.C., the lowest temperature ever recorded in that state.

Frequency of heavy snowstorms in the Northeast was almost as remarkable as the unparalleled cold in the Southeast. Most of these storms came either from the mid-continent area or up the Atlantic Coast. Two occurred during the first half of December, and three major ones during January.

During the first week of February, another Midwestern storm, after leaving four to ten inches of new snow in parts of Missouri and Illinois, produced a foot in the central Appalachians, up to ten inches along sections of the New Jersey coast and about seven inches in southeastern Massachusetts.

This storm was followed by a coastal one on Feb. 7 to 9, which dumped ten inches of additional snow in eastern portions of Pennsylvania and New York, and up to 18 inches in northern New England.

Stormy February

Another Atlantic coastal storm Feb. 15 to 17 brought heavy snow to the entire Northeast, with amounts exceeding a foot in many sections. It produced blizzard conditions in large areas and left a snow cover that measured 14 inches in Washington, D. C., up to 30 inches in eastern Pennsylvania, 20 inches in eastern New York and up to 20 inches in most of New England.

Boston measured a fall of 19.4 inches, which set new records there for 24 hours and for a single storm.

February closed with a raging blizzard in the northern Plains states, where many roads were closed by heavy snow drifted by winds up to 50 miles per hour, and another storm in the Northeast that was responsible for four to eight inches of new snow in northern New England.

Syracuse, N.Y., reported an all-time record for any month, a total of 72.6 inches of snow during February.

While the South shivered and the East was digging out from recurring snows, the Far West was enjoying abnormally mild temperatures that, at times, reached springtime levels. The relatively mild weather persisted through December and January in the northern Plains, where the Missouri River at Bismarck, N.D., did not freeze completely over until Dec. 31, the latest date on record, and lake navigation closed 20 days later than average at Green Bay, Wis.

The winter was wet both in the Far West and east of the Mississippi River. Heavy precipitation in the Northeast completely relieved the effects of the summer and fall drought, and brought the possibility of heavy spring floods.

The striking cloud picture on the cover of this week's SCIENCE NEWS LETTER is of what meteorologists call a "meso disturbance" associated with severe storms and tornadoes. Taken at night, at 8:15 p.m., in Minnesota, the cloud formation was followed by a hail storm with stones up to one inch in diameter formed.

A major outbreak of tornadoes in the middle Mississippi Valley on Dec. 18 was unusually far northward for the time of year, when more than a score of tornadoes touched the ground in Illinois alone that day. Several persons were killed, hundreds injured and property losses mounted into the millions.

The Weather Bureau's report of the unusual 1957-58 winter is contained in the *Weekly Weather and Crop Bulletin*, edited by J. L. Baldwin.

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● RADIO

Saturday, April 12, 1958, 1:30-1:45 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. Wynne Sharples, president and founder, National Cystic Fibrosis Research Foundation, Philadelphia, Pa., will discuss "A Deadly Childhood Disease."

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MEDICINE

Young Men Have Heart Ill

Coronary sclerosis, a disease of the heart arteries usually associated with old age, has been found in varying degrees of severity in young men.

➤ MANY OF the nation's young pilots have a heart disease known as coronary sclerosis, or hardening of the arteries of the heart.

This was indicated in the report of a study showing that 70% of 221 military flying personnel killed in airplane accidents between October, 1955, and the present had coronary sclerosis in varying degrees of severity.

The study, made by Drs. W. M. Glantz and V. A. Stembridge of the forensic and aviation pathology section, Armed Forces Institute of Pathology, Washington, was described to the Aero Medical Association meeting in Washington, D. C.

Although the percentage of those with coronary sclerosis at the time of their accidental death is high, in 95% of the accidents there was no direct relation between the heart disease and the cause of the accident.

One percent of the accidents, the scientists found, could be traced to heart failure as cause of accident. In the remaining four percent of the cases studied the cause of the accident was unexplained and might have been due to heart failure rather than mechanical failure.

A significant finding in the study was that the average age of the flying personnel with coronary sclerosis was 28 years. This tallies with an earlier reported study that showed 77% of the soldiers killed in Korea were suffering from heart disease.

Coronary sclerosis is too often considered a disease of old age, Drs. Glantz and Stembridge said.

In many instances it is still treated as such by both the military and civilian agencies responsible for screening pilots and other flying personnel.

The best tool presently available for detecting coronary sclerosis is the electrocardiogram (ECG). The Air Force, however, requires an ECG only when a potential pilot is first screened and then not until the pilot is 40 years of age unless the pilot himself complains of trouble. The Navy gives its first ECG at age 45 and the Civil Aeronautics Board requires no heart test at all for either private or commercial pilots' licenses.

In view of the fact that there is increasing evidence of heart disease in younger males, Drs. Glantz and Stembridge recommended that ECG's be given to all pilots at age 30 and every year thereafter. They recommended the ECG be administered while the pilot is under stress.

They also recommended that more money be put into research to find better techniques of detecting and studying coronary sclerosis.

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ASTRONAUTICS

Design Moon Space Ship

➤ A NUCLEAR-POWERED, non-stop space liner that would make a surface-to-surface flight from earth to the moon is seen as possible within 12 years.

Dr. Krafft A. Ehricke of Convair Division of General Dynamics Corporation envisioned the revolutionary space craft at the Air Force Association's third annual Jet Age Conference meeting in Washington. His proposal would eliminate the intermediate satellite station traditionally conceived as a necessary stepping-stone to interplanetary travel.

Although advancements in the technology of nuclear rocket propulsion are classified, Dr. Ehricke said he hoped the current Atomic Energy Commission program would provide practical power plants between 1965 and 1970. This would allow building a two-stage rocket vehicle capable of taking off from the earth's surface and flying direct to the moon or nearby planets.

Dr. Ehricke outlined preliminary designs for a 200-foot, 90-ton, two-stage chemo-nuclear vehicle capable of landing a 22,000-pound payload on the moon or orbiting a 30,000-pound payload around the planet Mars.

First stage is a delta-wing glider of 90-foot span, powered with conventional gasoline and liquid oxygen rockets developing 2,700,000 pounds of thrust. It would return to earth after boosting the second, manned stage beyond the earth's atmosphere.

The second stage is powered by feeding liquid hydrogen to a rocket engine that has a nuclear pile as its energy source. Thrust is obtained by expelling a stream of hydrogen ions from the rocket exhaust nozzle.

When in space, the nuclear engine would be positioned by cable 1,000 feet from the crew-carrying gondola to protect the space travelers from radiation hazards.

To land on the moon, the rocket would approach the surface tail first, the nuclear power plant landing 1,000 feet away. The sequence would be reversed for take-off.

Dr. Ehricke proposed the following timetable for lunar rocket test launchings, based on "a concerted national effort":

Between now and 1960, first shooting a rocket close to the moon, then impacting on the surface, going around the moon, establishing a satellite around it, and making a controlled landing.

Between 1964 and 1966, landing of instrumented vehicles on the moon, sending manned rockets in lunar reconnaissance.

Between 1967 and 1970, landing small scouting parties on the moon. Depending on the findings of the scouting parties, a decision would be made concerning building a permanent base there.

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TECHNOLOGY

High Accuracy Probe Measures Radioactivity

➤ COLUMBIA RIVER water used for cooling large production reactors at the Hanford atomic plant must be checked carefully for radioactive content.

An instrument designed to detect trace quantities of radioactive materials that may be present in the river has been perfected by R. W. Perkins, General Electric chemist. It can be used to identify sodium-24, manganese-56, copper-64, arsenic-76, chromium-51, neptunium-239, zinc-65, scandium-46, barium-140, cobalt-60 and manganese-54.

Replacing complicated chemical procedures, a sample of river water is placed in a probe which consists of an activated sodium iodide crystal and a multiplier phototube sealed in an aluminum can. The solids dissolved in the water are then concentrated by evaporating the water.

"Natural background" radiation is minimized by placing the probe in a heavily shielded cell. Measurements of gamma radiation energy content are then fed to an electronic computer where analysis of radioactive content determines the purity of the water.

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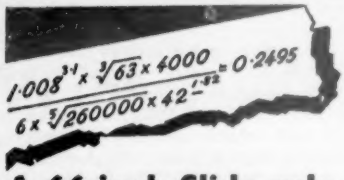
RADIATION ANALYZER—R. W. Perkins, General Electric chemist who developed the ultra-sensitive system of radiation analyses, places a small disc containing a river water salts sample on the probe portion of the electronic device.



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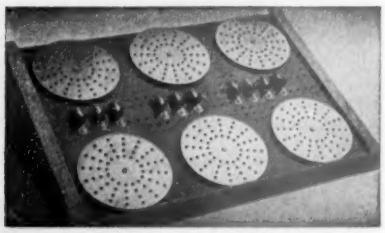

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ENGINEERING

Improve Tracking System For Moon and Satellites

➤ AN IMPROVED tracking system for aiming radar antennas at the moon and man-made satellites, 25 times more accurate than previous methods, was reported to the Institute of Radio Engineers meeting in New York.

The system operates on punched cards, Olaf A. Guzmann of the U.S. Army Signal Corps Engineering Laboratories, Fort Monmouth, N.J., reported. Naval Observatory data regarding the moon are punched on cards, then the information is fed to a digital computer that calculates where the moon will be at different instants with respect to the antenna.

Results of the computer's calculations are stored on magnetic tapes and fed into another kind of computer, an analogue system, that provides a continual flow of positional signals to keep the antenna aimed constantly and accurately at the moon.

Last year, scientists at the Naval Research Laboratory in Washington succeeded in receiving voice signals reflected from the moon, opening up the possibility of using the moon to relay long-distance radio transmissions.

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GEOPHYSICS

Explorer III Placed In Orbit Successfully

➤ THE THIRD United States artificial earth satellite, Explorer III, was launched by the Army's Jupiter C rocket at 12:38 p.m., March 26, at Cape Canaveral, Fla.

Facts and figures for this satellite, the lowest flying one of those launched, are: Time for completing one trip around the earth, 115.7 minutes; perigee, 110 miles; apogee, 1,738 miles; angle to the equator, 33.3 degrees; lifetime expectancy, "at least three or four weeks."

Since Explorer III's orbit dips closer the earth than had been planned, the satellite is subject to drag during the time it is in the region of thin air near the earth. If it goes through this part of its orbit in a broadside flight attitude, explained Dr. William H. Pickering, director of the Jet Propulsion Laboratory at California Institute of Technology, a month would be the maximum life expectancy.

A high-powered transmitter, equipped to make broadcasts of tape-recorded information on command from ground stations, is providing important information on cosmic rays. Early information received indicated that cosmic rays and temperature data are within the "expected limits" and that all of the micrometeorite impact detectors are in operating condition.

Explorer III, now known to scientists and astronomers as Satellite 1958 gamma, is expected to outlive the two-month batteries that power the radio transmitters in the satellite.

Like its predecessor Explorer I, this latest satellite weighs approximately 31 pounds; its shape is an 80-inch tube. Transmitters broadcast on a frequency of 108.03 and 108 megacycles.

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BIOCHEMISTRY

Chemicals in Bananas

Scientists have found that bananas contain two of the world's most powerful compounds, serotonin and norepinephrine, a discovery that may lead to future health aids.

➤ BANANAS can produce "false positive" indications of certain tumors in man without the tumors being present.

This banana counterfeiting and other startling facts about the popular fruit have been uncovered by a team of scientists at the National Heart Institute, Bethesda, Md.

Bananas contain two of the world's most powerful compounds, serotonin and norepinephrine, the latter also known as noradrenalin.

The presence of these compounds in bananas caused one scientist to comment, "bananas are now hot potatoes." But, he added, there is no indication that eating bananas is harmful to man.

The presence of the two compounds has led the research team to the following preliminary conclusions:

1. Eating bananas may lead to wrong chemical diagnoses of carcinoid tumors and pheochromocytoma, a high-blood-pressure producing tumor.

2. Bananas should be eliminated from the diets of those patients whose urine is being tested for these substances in tracking down other diseases, such as mental disease, where serotonin and norepinephrine have a known relationship to brain function.

3. The two chemicals may play an important role in turning bananas brown.

4. The two chemicals may lend laboratory truth to many of the traditional banana remedies used to treat such disorders as celiac disease in infants and children, peptic ulcers and constipation. Serotonin, for example, is known to inhibit gastric secretion and stimulate the smooth muscle of the intestine.

5. The banana research findings have led to the development of tests that may in turn lead to the discovery of new drugs for the treatment of angina pectoris and high blood pressure.

The way in which the Heart Institute scientists found the compounds in bananas —this is the first known report of norepinephrine in plant material—is almost as startling as their findings.

Dr. J. A. Anderson and his associates at the University of Minnesota Medical School were conducting experiments with a monkey. At the end of the study, the monkey was given a banana as a reward. The reward, normal monkey fare, yielded an unusual laboratory finding for Dr. Anderson, however: the banana-fed monkey produced an increased urinary excretion of the serotonin metabolite, 5-hydroxyindoleacetic acid.

This finding led to further experiments at the Heart Institute and was explained when the scientists found serotonin to be present in bananas.

Shortly thereafter the NHI banana research team held a staff conference at which they were discussing skin pigmentation and albinism, an abnormal disorder in which the afflicted person has no skin or hair pigmentation and is known as an "albino."

One scientist suggested that the reverse pigment change occurs in bananas when the banana peel changes from yellow to black.

The banana problem went back into the laboratory and what emerged was the discovery that bananas also contain norepinephrine, the most powerful drug of its kind and in wide use today in the treatment of cardiovascular collapse.

Both serotonin and norepinephrine were found through a series of complicated biochemical tests involving chromatography, or chemical fingerprinting, and fluorescence.

Each banana pulp, the part that is eaten, tested yielded about one-quarter of a milligram of norepinephrine and almost four milligrams of serotonin. The peel, on the other hand, contained more than seven milligrams of norepinephrine and a slightly higher amount of serotonin than did the pulp.

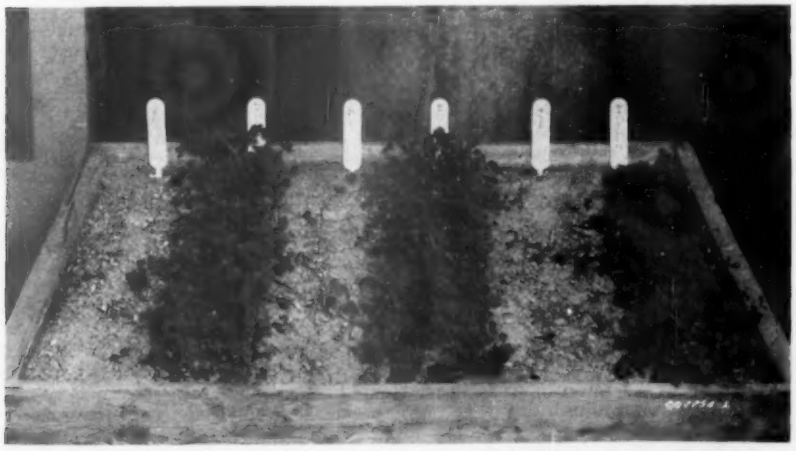
Just how the two compounds affect humans when given orally is not known, although studies are now underway to try to determine this. It is known that up to 20 milligrams of serotonin can be taken orally without physical effect. This would be equivalent to eating six bananas or more at one time.

In contrast, the scientists say, as little as one milligram of serotonin injected into man can produce marked effects.

Far into the cautious future is the hope that drugs capable of blocking the break-up of serotonin in the body also may prove to be successful palliatives for angina pectoris and high blood pressure. This parallel research, however, is in the very early stages of experimentation.

Preliminary findings in the banana study, reported in *Science* (March 21), are the work of Drs. T. Phillip Waalkes, Albert Sjoerdsma, Cyrus R. Creveling, Herbert Weissbach, and Sidney Udenfriend, of the section of experimental therapeutics and laboratory of clinical biochemistry, National Heart Institute of the National Institutes of Health.

Science News Letter, April 5, 1958



APHID-RESISTANT ALFALFA—A greenhouse flat, planted with non-resistant and aphid-resistant Buffalo alfalfa seed, vividly demonstrates the damage caused by the spotted alfalfa aphid. The three bare rows had been planted to non-resistant strains. The green seedlings are resistant Buffalo alfalfa, a "synthetic" alfalfa selected by scientists at the Kansas Agricultural Experiment Station. Further tests have to be made to determine the yield, winter hardiness, etc., of the new grass.

NUTRITION

Nutrition, Food Experts Study Eskimo Diet

➤ TEN NATIVE Eskimo villages in Alaska will be visited by a team of food and nutrition specialists in the first wide-scale study to determine the nutritional status of our neighbors to the far north, the Public Health Service has announced.

Approximately 1,000 Eskimos will participate in physical examinations and studies to show how adequately native diets meet nutritional requirements. Two Eskimo battalions of the Alaskan National Guard will be included in the study.

The survey team is under the supervision of the Government's Interdepartmental Committee on Nutrition for National Defense. The Public Health Service's Arctic Health Research Center (AHRC) is also assisting.

The types of food in the native diet have been under study for the past two years by Dr. Christine Heller, of the AHRC.

Science News Letter, April 5, 1958

TECHNOLOGY

Machine Reads Articles, Writes Their Abstracts

➤THIS STORY can be read and a shortened version of it written by an electronic machine.

Just such an electronic abstracter has been developed by engineers of the International Business Machines Corporation, scientists at the Institute of Radio Engineers meeting in New York learned.

The system is called "Auto-Abstract." It can read articles or scientific papers and then write an abstract or shortened version of what the text was all about. It promises to prove helpful in the current national problem of scanning and excerpting scientific articles, both in English and foreign languages.

According to H. P. Luhn of IBM, "Auto-Abstract" works this way:

The complete text of an article is transcribed onto magnetic or punched tape in a code that can be understood by an electronic "brain." The computer then analyzes the text word by word to "derive statistical information concerning the frequency and distribution of the words in the text."

From this, the electronic abstractor determines the relative degree of significance of the words and grades each sentence as to its importance. Those sentences scoring highest are extracted and printed out by the machine.

Mr. Luhn pointed out that the system can be used to speed up the translation of foreign scientific articles by turning out foreign language abstracts of the original paper.

If it were a Russian scientific report, for example, a translator would only need to translate a short version of the paper to find out what is being reported, rather than reading the entire paper.

Science News Letter, April 5, 1958

MEDICINE

Find Way Chromium May Cause Lung Cancer

➤ AN EXPLANATION of the way in which chromium may cause lung cancer among workers in the chromate-producing industry has been offered.

Dust particles from crude chromite ore and metallic chromium were suspended in various liquids to create an environment resembling the physiological conditions of the body. These crude ore dust particles then dissolved, Dr. Charles H. Grogan of the National Cancer Institute reported.

On the basis of further laboratory and animal investigations, he suggested that our own body fluids may have the ability to dissolve chromite ore, metallic chromium and other chromium-containing compounds when they are inhaled as dust.

"Reservoirs" of chromium dust could build up in the body, be dissolved and released throughout the body over long periods of time.

The cells which would form the wall of such a reservoir would be bathed in high concentrations of chromium. Eventually, these cells would undergo physiologic changes and could become cancerous, he pointed out.

Animal studies revealed that when chromite-ore dust was introduced into the lungs, the chromium was carried into other body organs. Results of these animal studies were compared with those reported by investigators studying the chromium content of tissue, blood and urine of chromate industry workers. The results of both animal and chromate worker studies proved to be comparable.

Exposure to fine dusts of chromite ore and metallic chromium represents a potential health hazard of "chronic nature," Dr. Grogan concluded.

Science News Letter, April 5, 1958

PUBLIC HEALTH

Babies' Bones Have Up to 5% More Radiation

➤ BONES OF babies born in the last six years receive on the average up to five percent more radiation because of fallout from hydrogen bombs than from natural radiation alone.

This dosage was reported by U.S. Atomic Energy Commissioner Dr. Willard F. Libby in a speech prepared for delivery to the Swiss Academy of Medical Sciences symposium on radioactive fallout at Lausanne, Switzerland. He based his estimates on the most recent results for radioactive material found in rainfall collections, for the strontium-90 content of milk, for animal bone and for human bone.

The present level of radiostrontium in the bones of young children, Dr. Libby reported, is about two milliroentgens per year, compared to an average natural dosage of 150 to 200 milliroentgens per year. A milliroentgen is a measure of X-ray activity.

Medical X-rays add about another 150 milliroentgens, Dr. Libby said. Another bomb by-product, radioactive cesium, and other penetrating radiations from radioactive fallout that are not taken up by the body contribute perhaps another three or four percent to the total dosage.

"Thus the total dosage to freshly formed human bone is at most five percent of the natural dosage," Dr. Libby concluded.

Variations in natural background dosages from place to place are enormous in magnitude compared to the average value.

Strontium-90 is produced at a level equivalent to about one millicurie per square mile of the earth's surface for every two megatons (million tons) of fission energy, Dr. Libby reported. This radioactive material, because of its chemical similarity to calcium, collects in human bone, where it is held for years and where its radiations might then cause leukemia or bone cancer.

Besides the effects of radioactive fallout, Dr. Libby also reported on the underground atomic bomb test from which no fallout escaped. This test, he said, made possible some non-military applications of nuclear explosions, including new information on the earth's internal structure and the excavation of artificial harbors. (See p. 217.)

Science News Letter, April 5, 1958

IN SCIENC

ENGINEERING

Automatic Postal System Being Tested in Canada

➤ AN AUTOMATIC postal system promising faster and more accurate delivery of mail than hand methods is now being tested in actual operation in Ottawa, Canada.

Details of the world's first automated post office were made public for the first time in this country at the Institute of Radio Engineers meeting in New York by Dr. Maurice Levy, technical adviser to the Canadian Post Office.

Mail to be processed by the automatic system is separated from other letters by using stamps impregnated with fluorescent material. Letters so stamped are sent to an electronic printer, where an operator codes on the back of each envelope the address information in fluorescent ink.

The coded mail is sorted automatically on a conveyor system controlled by an electronic computer, which detects the coded information and conveys the letters to the proper containers. Once letters reach local delivery areas, the mailman takes over.

Science News Letter, April 5, 1958

AGRICULTURE

Frost Damage in Citrus Can Be Detected by X-ray

➤ THE FIRST potentially practical method for detecting frost damage in citrus fruit mechanically has been developed by engineers at the University of California at Los Angeles.

The detector measures frost damage by beaming X-rays through fruit rotating on a platform. The resistance encountered by the X-rays is registered as a voltage reading. As the damage done by frost increases, the voltage reading increases due to the non-uniformity encountered by the X-ray. Non-uniformity of fruit sections is characteristic of frost damage.

The frost damage detector was designed by William T. Kyle, assistant research engineer, and Joseph E. McAteer.

Mr. Kyle believes a commercial model could be built to handle ten fruits per second. Rate of the experimental prototype is three or four per minute.

Cost of a commercial model would be $10,000 to $20,000, Mr. Kyle estimates. In addition to an X-ray source and an electronic device for measuring resistance variations, a commercial machine would include devices for channeling fruit from a conveyor belt into the damage detector. Bad fruit would be ejected automatically.

There is no radiation hazard in an X-ray detector because it is well-shielded, Mr. Kyle notes. Its operating voltage is comparatively low, functioning from ordinary 110-volt wiring.

Science News Letter, April 5, 1958

NCE FIELDS

VETERINARY MEDICINE

Chemicals Cure "Sore Head" in Sheep

➤ "SORE HEAD," a disease of sheep caused by a relative of the nematodes that cause elephantiasis in man, can be cured, the U.S. Department of Agriculture has reported.

This is good news for sheep raisers since there is evidence this rare skin malady is spreading. Until recently it has been found in the mountain areas of New Mexico, Arizona, Utah and Colorado where sheep graze above 6,000 feet. Now California, Oregon, Idaho, Montana and Vancouver Island, British Columbia, have reported infected sheep.

USDA scientist Dr. H. O. Peterson of the Agricultural Research Service's New Mexico laboratory, reports two new chemicals can completely cure even advanced stages of the disease. Tiny worms living in some of the main blood vessels cause sore head or filarial dermatosis.

Skin lesions may cover the entire side of the head, sometimes leading to partial or total blindness. Sores may also occur on the sheep's abdomen and feet. In tests, a single injection of Dow ET-57 directly into the rumen or first stomach of the affected animal cured it.

(Dow ET-57 is an organic phosphate chemical that has also been used successfully to combat cattle grubs.)

Equally good results were obtained by adding piperazine hexahydrate to the sheep's drinking water. Two ounces of an anthelmintic, a remedy for getting rid of intestinal worms, containing the compound were added to each half-gallon of water for three days.

Scientists believe both drugs can be used under range and field conditions. Even though "little or nothing is known about the life history of the parasite worm or how it is transmitted," the disease can now be controlled.

Science News Letter, April 5, 1958

GEOLOGY

Underground Test Shows Man Can Move Mountains

➤ MAN MAY soon be using atomic bombs to move mountains.

This is suggested in an evaluation reporting results of a deep underground detonation of an atomic device on Sept. 19, 1957, released by the Atomic Energy Commission.

It has been calculated, the AEC said, that the underground shot produced at least 50,000 tons of permeable broken rock and an additional 400,000 tons of crushed, but relatively impermeable rock.

"The large masses of broken rock," the AEC notes, "suggest such applications as use in mining to break up ore bodies for removal or leaching, and in oil strata to free crude oil trapped in relatively nonporous rock formations. It also is considered possible that heat resulting from an underground detonation in oil strata might increase the production of oil in certain situations by making it flow more freely through the rock formation."

Other possible peacetime uses of underground detonations with nuclear devices, the AEC says, include:

1. Piping water into a rock formation heated by a contained nuclear detonation to form steam for producing power or for other uses.

2. Placing various materials around a device so as to effect changes in the materials through nuclear reaction.

3. Further investigations of the makeup of the earth's crust through seismic studies of earth waves.

4. Moving earth in quantity, such as in digging a large canal.

The underground atomic test was made with an atomic device with a known yield of 1.7 kilotons. It took place 1,900 feet deep into the side of a tufa (volcanic) rock mesa near the northwest corner of the Nevada test site.

Radiological surveys after the shot, "showed that no radioactivity was released into the atmosphere."

Science News Letter, April 5, 1958

AGRICULTURE

"Bugs" and New Corn Combat Borer Invasion

➤ MICROSCOPIC "bugs" to combat a big bug, the European corn borer, are a new weapon against this pest that cost American farmers nearly $160,000,000 in 1957 alone.

George T. York, U.S. Department of Agriculture entomologist, told scientists at the Entomological Society of America meeting in St. Louis, Mo., that two microorganisms have been used successfully to control the corn borer. One is a bacterium, the other a fungus.

In recent tests made by Federal-state scientists at Ankeny, Iowa, the bacterium gave a 77% kill. This is comparable, Mr. York said, to the best control obtained by two applications of DDT. In another test 84% kill of the corn borers was obtained.

Both the bacterium, *Bacillus thuringiensis*, and the fungus, a species of *Beauveria*, produce their lethal effects without leaving any residues harmful to man or animals.

The fungus spores germinate on the borer's skin, killing as they grow and penetrate the skin. Like the bacterium, the fungas can be applied by a crop duster or fertilizer spreader.

W. D. Guthrie, also an USDA entomologist, reported on current research involving borer-resistant corn. So far one experimental inbred has been found that is highly resistant to some larval stages of the pest.

There is a great deal of variation among different kinds of corn, however. One line will resist stalk invasion but is very susceptible to infection by early larval stages, only to show resistance to later stages.

Science News Letter, April 5, 1958

PUBLIC HEALTH

Urge Lowering Limit For Body's Radium Level

➤ THE CONCENTRATION of radium presently permitted for persons being treated with this radioactive chemical should be lowered, a British scientist urges.

His finding implies that the levels for radioactive strontium, the lethal fallout product of hydrogen bombs, should also be lowered.

"Appreciable bodily injury" may result from radium concentrations below that now considered the highest permissible, Dr. William B. Looney of the department of radiotherapeutics, University of Cambridge, Cambridge, England, has found.

The present maximum permissible concentration, or MPC, of radium in the body is one-tenth of a millionth of a gram. Dr. Looney's conclusion is based on information accumulated during the past 34 years, then estimated to cover a period equivalent to a normal lifetime.

The three reasons Dr. Looney concludes the present MPC should be lowered until information is available on the effects of radium in man for at least a lifetime are:

1. Available information on the reliability of the presently accepted MPC is not conclusive.

2. No information on the effects of radium in man at concentrations at or near the present MPC for a period longer than 40 years is available.

3. The roentgenograph, which is the most sensitive clinical means for detecting skeletal damage, is an inadequate method for detecting changes in tissue structure, a more definite indication of cell damage.

Presently available evidence, Dr. Looney reports in *Science* (March 21), suggests that cancer induced by radiation results from severe changes in tissue environment.

Science News Letter, April 5, 1958

GEOGRAPHY

India Drifted Northward For 100,000,000 Years

➤ INDIA DRIFTED northward with respect to the equator from 150,000,000 until 50,000,000 years ago.

This is the tentative conclusion of one British and two Indian scientists, reported in *Nature* (March 22), from their studies of rock magnetization.

They suggest that the Indian land mass occupied a position south of the equator at the time the rocks became magnetized. The corresponding ancient position of the north geographical pole would then be in the southern Caribbean Sea, at a latitude of 13 degrees north and a longitude of 70 degrees west.

The rock samples were taken from eastern Bihar. They were analyzed in Bombay and London, England, by Drs. J. A. Clegg of Imperial College, London, and C. Radakrishnamurty and P. W. Sahasrabudhe of Tata Institute of Fundamental Research, Bombay.

Science News Letter, April 5, 1958

ROCKETS AND MISSILES

Help for Rocketeers

Past attempts to snuff out rocketry progress and development of science pioneers may be repeated due to negative legislation that will force youngsters to experiment secretly.

By DAVID PURSGLOVE

➤ AMERICA FACES the danger of seeing a large segment of its young science enthusiasts forced underground into secret societies, running from the police, hiding from their own parents, and not daring to divulge their activities to adults who could guide them and perhaps even save their lives.

This is the fear of responsible educators, scientists and military men who are counting on today's young scientists and amateur rocketeers for tomorrow's leadership.

Officials of the Department of Labor, U.S. Office of Education, science and rocketry experts at the Pentagon, and military service leaders have told SCIENCE SERVICE the frenzy of alarm over the great increase in student rocketry during the past six months threatens to rob the nation's already-too-small scientific and technical manpower pool of many brains that are potentially among the best.

Self-appointed safety experts, they say, have rushed into print with ominous warnings and demands for negative legislation without offering any solid, constructive suggestions. Recognized safety authorities have been pressured into making hasty statements before they have had opportunity to study enough of the real hazards of rocketry to be able to formulate helpful plans.

And a helpful plan is what is most needed at present, educators agree.

Clear minds, worried but not rattled by the increasing negative attitude toward amateur rocketry, are now working from several directions toward a plan of national, community, school and home help and protection for the missilemen-to-be.

Organized Study of the Problem

The organizations working intensively on those plans that seem to have the best chances of being put into action include the Department of Health, Education and Welfare; Department of Defense; Department of Labor, which is not only interested in protecting our manpower reserves but also hopes to learn of new safety measures that can be employed in industry; Science Clubs of America and the American Rocket Society.

Many smaller groups as well as private industries also are working toward community and national programs to help the youngsters learn about rocketry in a safe manner.

One surprising conclusion can be drawn from a study of these plans in their formative stages: they not only do not conflict, but actually agree with each other on all major points, although proposed methods of implementation vary from group to group. Perhaps the reason can be explained by the urgent need—spring will soon bring thousands of youngsters and their rockets outdoors—to protect life and limb and at the same time build our scientific reserve.

Most of the plans are being built within the framework of an outline proposed by an Army missiles expert who himself was once the victim of a negative attitude toward rocketry and was forced to "hide from the cops" on more than one occasion.

Lt. Col. Charles M. Parkin Jr., Engineer Research and Development Laboratories, Fort Belvoir, Va., has recently become the idol and counselor of teen-agers from coast to coast.

Expert Help Available

His job as Army Ballistic Missile Agency project officer and assistant liaison officer between Fort Belvoir and Redstone Arsenal, Huntsville, Ala., keeps him hard at work in the very heart of our military rocket program.

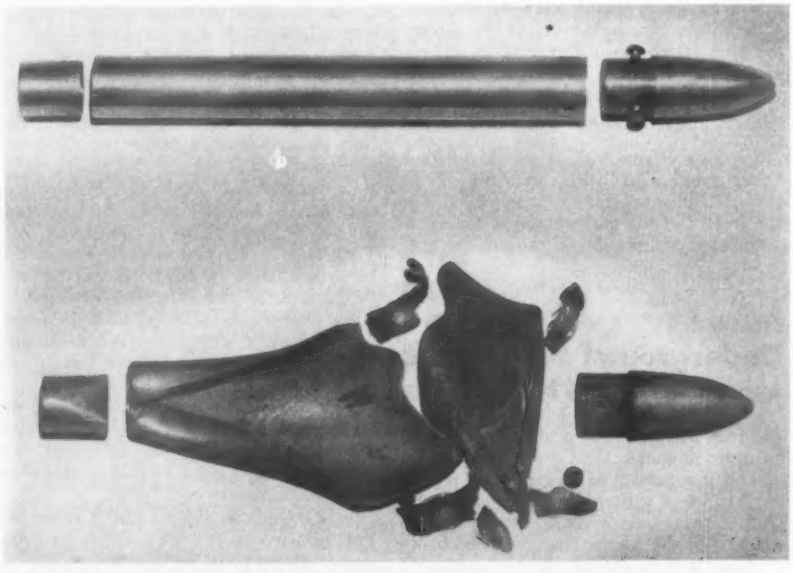
However, missile engineer Parkin is most widely known for the other 40 hours of his 80-hour work week.

Hundreds of high school students in Washington and nearby Maryland and Virginia have witnessed Col. Parkin's demonstrations of rocketry safety techniques and, under his guidance at night and on week ends, have developed count-down techniques covering every aspect of safety. He has helped them build safe static firing stands for pre-flight testing that has spotted many unsafe rockets before they were delivered to launching sites.

The nation's press has been filled with pictures of rocket launchings by his proteges at A. P. Hill Military Reservation south of Washington. Not every launching has resulted in a successful flight, but on the other hand there has yet to be a single injury, thanks to student-designed safety measures.

The A. P. Hill launching procedures and other safe amateur count-down practices are likened to Cape Canaveral firings in a form letter used by Col. Parkin to answer part of the 200 letters he receives each week from students and youth leaders requesting rocketry safety information:

"Rocketry can be learned and tried in absolute safety without in any way lessening the excitement of the experiments. (Do you hear of anyone being killed by a failure of a Jupiter or Vanguard firing? And yet, these rockets are taller than a three-story building. .The scientists, technicians, and



WRONG FUEL SPELLS DISASTER—A well-constructed amateur rocket, such as the seven-inch, heavy-gauge aluminum student rocket shown at the top, can be a safe, instructive scientific instrument when handled properly. Lt. Col. Charles M. Parkin Jr., who warns against blasting caps and black powder as dangerous fuels, "launched" an identical model inside a container. Fragments at the bottom resulted from loading with a small charge of black powder.

engineers all know the safety procedures involved and practice them.)"

The form letter covers all aspects of rocketry safety and answers most of the questions asked. However, Col. Parkin finds time to give a personal answer to many of the problems that cannot be covered routinely. He urges amateurs who have a rocket ready for firing to mark their letters at the top with a red X.

These letters are given immediate attention, frequently by telephone, the moment Col. Parkin receives them. He questions the amateur about his rocket, fuel and safety count-down. While still on the telephone, the missile expert decides whether the rocket and proposed launching conditions are safe and advises accordingly.

Besides his almost constant close work with amateur rocketry groups in the Washington area, Col. Parkin has also worked with other groups and, perhaps more important, educators and science youth leaders in all parts of the nation. He is among those who fear that stringent controls will drive rocketry amateurs underground, as was the case with America's rocket pioneers in the 1930's. However, some controls, instigated within a plan of guidance and help, are necessary safeguards.

Now a close friend of Dr. Wernher von Braun, young Charles Parkin was firing home-made rockets in Pittsburgh and Lancaster, Pa., in the early 1930's about the same time young Wernher von Braun was firing his experimental models in Germany. Col. Parkin points to a statement used several times by Dr. von Braun in contrasting Germany's rapid rise in rocketry to America's comparative lateness in the field Col. Parkin quotes Dr. von Braun as saying:

"The main difference, Chuck, is that I had the support of my government at the same time you were having to run from your police."

Promise of Amateur Rocketry

Col. Parkin believes there are three important aspects of amateur rocketry, two of which are often overlooked, that must be considered in developing any official policy:

1. Rocketry can be safer than driving an automobile, or it can be the most dangerous enterprise imagined, depending on how it is conducted. All recognized safety precautions must be observed.

2. The outlawing of amateur rocketry or the imposition of impossibly stringent controls will succeed only in forcing youngsters to perform experiments in secret, without the benefit of competent guidance. "Soon the only reports we would have on the status of amateur rocketry would be hospital reports."

3. When students are given a goal, a plan and the right kind of supervision, their experiments can develop among the students the kind of scientific knowledge and leadership that we desperately need. "At the very least, amateur rocketry conducted along scientific research lines will inspire a greater number of youngsters to a more interested and concentrated study of science and to a more thoughtful consideration of science as a career."

These are the same three points that have been reiterated to SCIENCE SERVICE by the responsible officials of those Government and private agencies trying to develop a satisfactory plan of help and protection for rocketry students.

Offer Advice and Instruction

Here is Col. Parkin's outline as currently being considered by Federal and private groups:

1. Assign an officer to the Office of Assistant to the Secretary of Defense for Guided Missiles. As a start, this officer will organize, with the help of Government, industry and private organizations, high schools and science clubs, missile and rocket clubs within the Washington, D. C. area.

2. Later, national expansion will be accomplished through the sections of the American Rocket Society. The objectives of these clubs will be to stimulate and motivate the youth and to encourage them to enter scientific fields connected with research, development, engineering and production of guided missiles.

3. These objectives will be accomplished through formal classes, individual and group projects, static test firings, live firings and exhibits of projects to the Government and to the public. The officer assigned will be chairman of the Advisory Committee for Missile and Rocket Amateurs.

4. The Advisory Committee for Missile and Rocket Amateurs of the National Capital Section of the American Rocket Society will help organize missile and rocket clubs within the high schools of the Washington, D.C., area.

In addition, science clubs of the Washington, D.C., area will be encouraged to cultivate the skills and talents of their interested members in fields connected with the missiles and rockets. Additional information and publicity will be passed on from time to time through the press and radio.

5. The Advisory Committee will assist the missile and rocket clubs and the science clubs in securing instructors and textbooks.

6. During the course of instruction, groups will be supervised while they construct models.

7. Upon completion, the projects will be evaluated. If evaluation indicates static firing as the next step, then the project will be statically tested. The static firing will be conducted at the high schools under high school supervision if stands and pits are available or at nearby commercial or service facilities under their supervision.

8. The Advisory Committee can help the high schools by assisting them in securing static test facilities. After static firings, live firings will be arranged at nearby service facilities.

Based on Col. Parkin's plan and suggestions from this writer, the workshop on the school's contribution to safety of the President's Conference on Occupational Safety on March 27 recommended a national program to encourage high school students to conduct rocket experiments under supervision, in the belief that students "will not be dissuaded from their desire to experiment by mere laws."

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• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ATOMS FOR POWER: United States Policy in Atomic Energy Development—Philip C. Jessup, Robert Oppenheimer and others—*American Assembly, Columbia Univ.*, 165 p., paper, $1. Including some of the addresses at the Assembly on the mountain top together with conclusions and recommendations arrived at.

THE BEHAVIOR OF MAN: Introduction to Psychology—Karl U. Smith and William M. Smith—*Holt*, 516 p., designed and illus. by Donald M. Anderson, $6.95. Although an elementary text, this is a beautiful book in which art is harmonized with writing to give new meaning to the ideas expressed and to intrigue the student's interest.

BIOLOGICAL ASPECTS OF CANCER—Julian Huxley—*Harcourt*, 156 p., $3.75. "Cancer," the author explains, "far from being a field of purely medical concern, is a key subject for general biology."

BOYS' BOOK OF THE AIR—Eric Leyland and T. E. Scott-Chard, Eds.—*Roy Pubs.*, 128 p., illus., $3. The reader is taken behind the scenes in the Air Age by prominent figures in the world of aviation.

FATIGUE OF AIRCRAFT STRUCTURES—A. R. Vollmecke and others—*Am. Soc. for Testing Materials*, 100 p., illus., $2.75. Papers presented at the Second Pacific Area National Meeting.

FUNDAMENTALS OF MATHEMATICS—M. Richardson—*Macmillan*, rev. ed., 507 p., illus., $6.50. A textbook on mathematics as a basis for all science.

THE FUTURE SUPPLY OF OIL AND GAS: A Study of the Availability of Crude Oil, Natural Gas, and Natural Gas Liquids in the United States in the Period Through 1975—Bruce C. Netschert—*Johns Hopkins Press*, for Resources for the Future, 134 p., $3. Part of a larger study of the energy position of the U. S. in the immediate future.

GREAT MOMENTS IN ARCHAEOLOGY—Ivor Noël Hume—*Roy Pubs.*, 127 p., illus. with drawings by Bruce Cornwell, $2.50. Exciting stories for young people of great archaeological discoveries.

THE GUIDE TO GARDEN FLOWERS: Their Identity and Culture—Norman Taylor—*Houghton*, 315 p., illus. with drawings in color and black and white by Eduardo Salgado, $4.95. To help the garden lover to know his flowers better.

HARVARD CASE HISTORIES IN EXPERIMENTAL SCIENCE—James Bryant Conant, Ed.—*Harvard Univ. Press*, 639 p., illus., 2 volumes $10 a set. Intended to help the reader relate important developments in the natural sciences to those in other fields of human activity.

HEATING, VENTILATING, AIR CONDITIONING GUIDE 1958: Volume 36—M. W. Keyes, Chairman, Guide Committee—*Am. Soc. of Heating and Air-Conditioning Eng.*, 1,272 p., illus., $12. Reference data for engineers.

INSTRUMENTAL METHODS OF ANALYSIS—Hobart H. Willard, Lynne L. Merritt, Jr., and John A. Dean—*Van Nostrand*, 3d ed., 626 p., illus., $7.50. An almost completely re-written popular text.

ME AND FRUMPET: An Adventure With Size and Science—Evans G. Valens, foreword by Edward Teller—*Dutton*, 127 p., illus., $2.75. A delightful story for little children about a boy and a pipe-cleaner, man and a model railroad, all of which teaches a lot about science.

THE MEDICAL WORLD OF THE EIGHTEENTH CENTURY—Lester S. King—*Univ. of Chicago Press*, 346 p., illus., $5.75. Revealing some surprises in medical history.

NEW AND NONOFFICIAL DRUGS 1958—Council on Drugs, AMA—*Lippincott*, 645 p., $3.35.

ORAL COMMUNICATION OF TECHNICAL INFORMATION—Robert S. Casey—*Reinhold*, 199 p., illus., $4.50. Hints to scientists and engineers on how to preside at a meeting and how to present technical material effectively.

PROJECT SATELLITE—Wernher von Braun, Kenneth W. Gatland, Harry E. Ross, and A. V. Cleaver—*British Bk. Centre*, 169 p., illus. with photographs and drawings by John W. Wood, $5. Describing the historical background from the beginnings of rocketry in Germany in 1928 and dipping into the future to forecast what is ahead.

QUANTUM MECHANICS OF ONE- AND TWO-ELECTRON ATOMS—Hans A. Bethe and Edwin E. Salpeter—*Academic*, 369 p., $10. A book for graduate students on applied quantum mechanics and a reference work for physicists.

RADIATION: What It Is and How It Affects You—Jack Schubert and Ralph E. Lapp—*Viking*, 314 p., paper, $1.25. "Man," warn the authors, "is no fruit fly. If he learns to live with radiation, it will be only through mastering its use and controlling its hazards."

SCIENTIFIC RUSSIAN: A Textbook for Classes and Self-Study—James W. Perry—*Interscience*, 816 p., $7.50. Not designed to teach conversational Russian, this text is intended to aid the scientist in learning to read Russian scientific publications.

A SHORT COURSE IN DIFFERENTIAL EQUATIONS—Earl D. Rainville—*Macmillan*, 2d ed., 259 p., $4.50. A college text.

SPLITTING OF TERMS IN CRYSTALS—Hans A. Bethe—*Consultants Bureau*, complete English translation, 69 p., paper, $3. On the wave mechanics of crystals.

THE STORY OF OUR TIME: 1958 Encyclopedia Year Book—Marian Lockwood, Ed.—*Grolier Society*, 432 p., illus., $7.50. A picture story of the events of 1957—International Geophysical Year and year of the sputnik. An account of the Science Highlights of the year is provided by Science Service.

Science News Letter, April 5, 1958

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MEDICINE

Oral Preparation Delays Menses

➤ A SIMPLE oral preparation has been developed that successfully delays a woman's normal menstrual cycle.

The preparation, norethindrone, has delayed the cycle as long as seven months. Results show it relieves painful menstruation, helps prevent habitual abortion and allows women freedom from menses where it is undesirable.

Doses as low as 20 mg. daily can be given as late as seven days after ovulation and still delay the menses effectively, Drs. Robert B. Greenblatt, of the Medical College of Georgia, and Edwin C. Jungck, University of Georgia School of Medicine, both at Augusta, Ga., report in the *Journal of the American Medical Association* (March 22).

This delay can also help rebuild and strengthen the hemoglobin supply which takes a dip during menstruation and sometimes never returns to nonanemic levels. In addition, this simple method of delay opens the way for a new clinical measurement of the comparative effectiveness of progesterone compounds, hormones which prepare the uterus for the fertilized egg, the doctors explain.

Science News Letter, April 5, 1958

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CHEMISTRY

Plastic and Sand Beat Heat Better Than Steel

➤ A PLASTIC reinforced with "fibers of sand" that can withstand high blowtorch and rocket engine temperatures much better than hard steel plate may become the newest of the urgently sought materials for rocket nose cones, exhaust nozzles and guidance fins.

In a recent test, the new reinforced plastic, called Astrolite, was only scorched and marred after 142 seconds exposure to an oxyacetylene blowtorch flame at 4,500 degrees Fahrenheit. The same flame cut completely through a half-inch slab of steel in just 42 seconds, the developers, H. I. Thompson Fiber Glass Co., Los Angeles, reported.

The new plastic is expected to have applications at temperatures up to 10,000 degrees Fahrenheit.

Most of Astrolite's potential uses are in the missile field. C. S. Brown, assistant executive field engineer, said the plastic should prove satisfactory for missile nose cones subjected to extremely high temperatures upon re-entering the earth's atmosphere.

Astrolite is composed of a phenolic resin binder (plastic) holding together pure silica fibers. Silica, silicon dioxide, in varying degrees of purity is sand. It is produced in a fibrous form in much the same manner as the mineral asbestos is produced as fibers.

The developers said Astrolite has proved superior to asbestos-phenolic and fiber glass-phenolic materials.

Science News Letter, April 5, 1958

MEDICINE

Substance Aids Body's Use of Vitamins, Iron

➤ A SWEET-TASTING substance found in red seaweed, quince, the bosc pear and mountain ash berry has been found to increase body absorption of vitamin B-12 and iron.

The sweet-tasting agent is D-sorbitol, a carbohydrate that was isolated from fruits in the early 1870's but remained a laboratory curiosity for almost 60 years.

The significance of the D-sorbitol lies in its ability to bypass the "absorption barrier" in the gastrointestinal tract, allowing more vitamin B-12 and iron into the blood stream, the Smith, Kline and French Laboratories, Philadelphia, has reported.

This can mean increased nutrition for the aged, increased iron supplies for the pregnant, and rapid tissue growth for the convalescent and adolescent.

The discovery is medically important because in many cases of nutritional deficiency, such as lack of vitamin B-12, the fault lies in poor absorption, not lack of nutrients.

The "absorption barrier" is the inability of the gastrointestinal tract to absorb B-12 unless certain gastric substances are present. D-sorbitol does away with the necessity of adding any gastric substance to aid absorption of B-12.

Science News Letter, April 5, 1958

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Questions

BIOCHEMISTRY—What chemical compound used in treatment of cardiovascular collapse has been found in bananas? p. 215.

ENGINEERING—How efficient is the new experimental model thermo-electron engine? p. 211.

MEDICINE—What is the best tool for detecting coronary sclerosis? p. 213.

Photographs: Cover, Keith W. Gunderson; p. 211, U. S. Naval Research Laboratory; p. 213, General Electric Company; p. 215, Kansas State College; p. 218, Army Engineer Research and Development Laboratories; p. 224, Bakelite Company.

MEDICINE

Early Detection of Polyps Can Reduce Cancer Rate

➤ THE MONTHLY death rate of 2,500 from cancer of the colon can be reduced if people will heed the ample warning signs given prior to cancer development.

Polyps, gourdlike tumors that grow from the lining of the intestines, are usually the forerunners of malignancy or harmful tumors, Dr. Neil W. Woodward Sr., associate professor of surgery at the University of Oklahoma School of Medicine, told the 11th biennial Congress of the International College of Surgeons, meeting in Los Angeles, Calif.

Polyps can be detected by visual examination in about three-fourths of the cases and in nearly all of these the removal may be accomplished by a simple office procedure. Some may be discovered by X-ray.

The locations of colonic cancers and of polyps of the colon are practically identical. The polyp which originates in the mucous membrane is destined to be the origin of a cancerous growth if the individual lives long enough, conditions become favorable and the polyp is subjected to a malignant stimulus, the Oklahoma City surgeon said.

Warning signs which polyps create include blood in the stool in varying amounts, change of bowel habit, presence of excess mucus, pain which is generalized and vague in character, nausea or weakness.

Dr. Woodward urged that relatives of patients with polyps or cancer of the colon be examined because experience has shown there is a tendency for the disease to run in families.

Science News Letter, April 5, 1958

Do You Know?

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Depending upon how fast you want to go, a round-the-world cruise can be yours for as little as $250-$300 a month. And there are shorter trips. Fast, uncrowded voyages to England, France, South America; two- or three-week vacations up and down the Pacific Coast or elsewhere. Name the port and the chances are you can find it listed in "Travel Routes Around the World." This is the book that names the lines, tells where to go, how much they charge, briefly describes accommodations. Hundreds of thousands of travelers all over the world swear by it. Travel editors and travel writers say "To learn how to travel for as little as you'd spend at a resort get 'Travel Routes Around the World'."

It's yours for just $1 and the new big 128-page edition includes practically every passenger-carrying service starting from or going to New York, Canada, New Orleans, the Pacific Coast, Mexico, South America, England, France, Africa, the Indies, Australia, the South Seas, Japan, Hawaii, etc. There's a whole section called How to See the World at Low Cost plus pages and pages of maps.

A big $1 worth especially as it can open the way to more travel than you ever thought possible. For your copy, simply fill out coupon.

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New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 929. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

RULER SQUARE has a prism for drawing 90-degree angles optically. The ruler can also be used for drawing squares, rectangles, parallel lines and exact right angle lines without the need of a triangle or T-square. The transparent, plastic prism runs along the top edge of the ruler.

Science News Letter, April 5, 1958

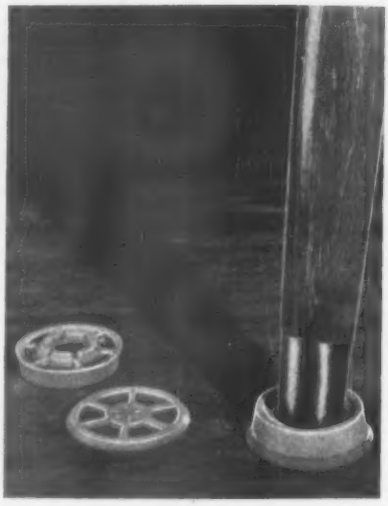
DEEP-HOLE LOCATOR for fishermen is a combination depth gauge and thermometer. About the size of a fountain pen, the gauge can be cast like a plug or used on a hand line. Made of clear plastic, it houses a depth scale and temperature readings.

Science News Letter, April 5, 1958

SLED AND SCOOTER COMBINATION is powered by a two and three-quarters-horsepower engine. With the wheels on, it is a motor scooter. With skis on, it is a motor sled. The combination traveler weighs 196 pounds and is capable of cruising along at speeds up to 20 miles per hour.

Science News Letter, April 5, 1958

TWO-PIECE CASTERS to reduce clattering of furniture on hard-surface floors and make it possible to slide the furniture about without scratching the floor are made of plastic. The top section of each caster, shown in the photograph, is a cup molded



of one kind of plastic, and the base is molded of another. They are available in blond, brown or clear colors and round or square shapes.

Science News Letter, April 5, 1958

STATION WAGON SLEEPING PORCH is a canvas car cover. The porch has an insectproof window that can be closed or opened from the inside. The window is protected by a canvas storm flap. Elastic shock cords hold the porch in place. Weighing seven pounds, the canvas wagon converter is available for different makes and models.

Science News Letter, April 5, 1958

GARDEN WATERER consists of a small diameter polyvinyl hose with slot and pin hole discharge. It can be used for a long-term soaking or gentle spraying. The waterer permits slide valve control of water delivery to individual plants. It also has a pressure reducer to prevent loss by bursting.

Science News Letter, April 5, 1958

PENCIL HOLDER for desks can also be used to keep rubber bands, paper clips and other needs at your fingertips. The wooden desk aid holds up to ten pencils or pens and has three front compartments. It measures three by three by nine inches.

Science News Letter, April 5, 1958

ROLLER SKATES are described as adaptable to any type of shoe, even sneakers and ballet slippers. Made largely of a nylon resin, the skates roll along on quieting plastic. Available in a choice of colors, the roller skates can be extended to a length of ten and one-quarter inches.

Science News Letter, April 5, 1958

Nature Ramblings

By HORACE LOFTIN

➤ IT IS HARD to believe, with a very cold winter just behind us, that the earth is apparently in a "warming up" period. Over the years, however, gradually increasing average temperatures and other signs, such as the receding of some glaciers, have indicated that temperatures may be on the upswing.

At the same time, some of our fishes, reptiles, birds and mammals have been found farther north than previously recorded. The mocking bird, for example, seems to be extending its range farther and farther above the Mason-Dixon line.

Some or all of this northward migration may be due to the general rise in average temperature.

On the other hand, it may be that man-made changes in the environment, population increases, evolving habits or some other unknown factors play a large part in this movement. Until more facts are accumulated, the real answers to this puzzle are anybody's reasonable guess.

Exotic Mammals

One of the United States' most tropical and exotic forms of life, the armadillo, has been actively spreading its range lately. It has marched in a few years from Mexico and a restricted area in Texas into several nearby southern states. Is the armadillo moving with the weather?

Among the armadillo's close kin are the sloths and the anteaters. All three are members of the order of mammals called the Xenarthra. This group is characterized by cylindrical teeth that lack the hardening substance, enamel, common in the other orders.

A quick exception to this rule is the anteater, which is toothless, feeding on ants and other insects by picking them up on its long sticky tongue. Can we look, then, for some of these creatures to "invade" the United States?

The answer is "possible but hardly probable." Sloths, anteaters and other species of armadillos are found throughout South and Central America and into Mexico, but the ecological barriers keeping them from the U.S. border will likely remain intact.

Our particular species of armadillo already had its foot in the door, so to speak, by living habits and a range that carried it to and past our border. The other Xenarthra have too far to travel and too many changes of habits and needs to make before the animals can become successful immigrants.

Science News Letter, April 5, 1958